Claims

1. Method for the production of a film tube on a cellulose basis, which is strengthened by an insert, by extruding an aqueous cellulose-N-methyl-morpholine N-oxide (NMMO) solution onto the insert, characterized in that the insert is drawn from a roll, treated with emulsifiers, wetting and/or anchoring agents and formed into a tubular envelope with overlapping longitudinal seam which is cemented ahead of a nozzle block through which the envelope is brought and in which the cellulose-NMMO solution is applied to the envelope and penetrates the latter, in order to obtain an insert-reinforced film tube, that the interior of the film tube is filled with an aqueous NMMO solution, and that the film tube exits from the nozzle block and enters into a spin bath, is turned about in the latter and brought out.

2. Method according to claim 1, characterized in that the tubular envelope passes through a heating section situated ahead of the nozzle block, in which it is preheated with hot air to the temperature of the extruded cellulose-NMMO solution.

3. Method according to claim 1, characterized in that pressure-regulated supporting air is blown into the interior of the film tube after departure from the nozzle block.

4. Method according to claim 1, characterized in that the film tube is carried through a heated annular gauging disk through which a heating medium flows in a controlled circuit.

5. Method according to claim 1, characterized in that the aqueous NMMO solution is delivered through the nozzle block into the interior of the film tube

and also removed from it, the delivery and removal being performed at a distance apart from one another.

6. Method according to claim 5, characterized in that the level of the delivery of the aqueous NMMO solution is adjustable and that the removal is performed such that the level in the film tube is variably higher by up to 20 mm and lower by up to 45 mm than the level in the spin bath.

7. Method according to claim 1, characterized in that the film tube, after leaving the nozzle block, runs through an air section until it enters into the spin bath, and that in the air section an external temperature treatment takes place which regulates the rate of solidification of the cellulose-NMMO solution of the film tube.

8. Method according to claim 1, characterized in that the film tube plunges vertically into the spin bath and with maintenance of a constant tension is turned about by a powered return roll running close to the bottom of the spin bath tube and is carried out upwardly at an angle from the spin bath.

9. Method according to claim 1, characterized in that the spin bath level inside and outside of the film tube is lowered as far as the upper edge of a return roll and that the film tube is sprayed inside and out with spin bath.

10. Method according to claim 1, characterized in that the longitudinal seam of the tubular envelope is cemented with straight NMMO or a cellulose-NMMO solution at a temperature of 15 to 110°C, especially at the temperature of the cellulose-NMMO solution extruded in the nozzle block.

11. Method according to claim 1, characterized in that the cellulose content of the extruded cellulose-NMMO solution amounts to 1 to 15 wt.%, especially 3 to 7 wt.-% with respect to the total solution, and that the average degree of polymerization ranges from 250 to 800, especially from 300 to 500.

12. Method according to claim 1, characterized in that the aqueous NMMO solution of the spin bath has an NMMO concentration of 5 - 50 wt.-%, especially of 8 to 20 wt.-% and that the spin bath is adjusted to 0 to 50°C, especially 2 to 20°C.

13. Apparatus for the production of a film tube on a cellulose basis which an insert strengthens, by extrusion of an aqueous cellulose-N-methyl-morpholine N-oxide (NMMO) solution onto the insert, with a nozzle block (7) and a spin bath (11), characterized in that a supply roll (2) for the insert (3), a deflector roll (4) with a system for the application of additives onto the insert carried from the supply roll over the deflector roll, and a forming section (5) in which the insert (3) is formed into a tubular envelope (6) with overlapping longitudinal seam are present, that the tubular envelope (6) passes through the nozzle block (7) which is preceded by an adhering system (25) for cementing the longitudinal seam of the tubular envelope (6) and which contains an annular nozzle (21) from whose nozzle gap the cellulose-NMMO solution is extruded into the tubular envelope (6) to form a film tube (10), that between the exit from the nozzle block (7) and the spin bath (11) a controlled-temperature air section (9) is present in a spin tub (12), that near the bottom of the spin tub (12) a deflector roll (13) is disposed for the film tube plunging vertically into the spin bath, and that a delivery and removal tube (18, 19) is present in the interior of the film tube (19) for the aqueous NMMO solution, as well as a duct (20) for the supporting air.

14. Apparatus for the production of a film tube according to claim 13, characterized in that the insert (3) is selected from the group, paper, nonwoven, fiber fleece, fiber paper, the fibers being especially long hemp fibers.

15. Apparatus for the production of a film tube according to claim 13, characterized in that a preheating system (15) for the tubular envelope (6) is disposed ahead of the nozzle block (7), and that the preheating system (15) is connected via hot air duct (22, 23) and an exhaust duct (24) to a controllable heater (17) from which air heated in the circuit flows into the preheating system (15) and from which cooled air flows back into the heater (17).

16. Apparatus for the production of a film tube according to claim 13, characterized in that the nozzle block (7) contains a ring nozzle (21) which is heated by a heating medium, and that the delivery tube, the removal tube (18, 19) and the duct (20) for the air supporting the film tube (10) are brought centrally through a gauging ring disk (8) which is arranged concentrically with the ring nozzle (21) in the film tube interior and forms with the latter an annular gap (26) through which the film tube (10) runs.

17. Apparatus for the production of a film tube according to claim 16, characterized in that the gauging ring disk (8) is connected to the heating circuit (16) for the purpose of heating.

18. Apparatus for the production of a film tube according to claim 16, characterized in that the delivery tube (18) and the removal tube (19) are individually height-adjustable within the film tube (10).

19. Apparatus for the production of a film tube according to claim 18, characterized in that the delivery tube (18) is disposed in an upper position at the beginning of the delivery of the aqueous NMMO solution into the film tube (10) and at the

start of continuous operation assumes a position above the return roll (13).

20. Apparatus for the production of a film tube according to claim 16, characterized in that the heating medium flows through the ring nozzle and is carried in a controlled heating circuit (16).

21. Apparatus for the production of a film tube according to claim 13, characterized in that the air section (9) amounts to 1 to 1000 mm, especially 200 to 500 mm, and that if necessary the film tube (10) can be heated to delay its solidification or cooled to accelerate its solidification in the air section.

22. Apparatus for the production of a film tube according to claim 13, characterized in that the return roll (13) disposed near the bottom of the spin tub (12) is driven and exerts a constant tension on the vertically descending film tube (10).

23. Apparatus for the production of a film tube according to claim 22, characterized in that the film tube (10) lies flat against the return foll (13) along a line of contact (27) as a result of the tension exerted on the film tube (10).

24. Apparatus for the production of a film tube according to claim 13, characterized in that the spin bath (11) and the aqueous NMMO solution in the film tube (10) have equal NMMO concentrations at the beginning of the extrusion of the film tube (10).

25. Apparatus for the production of a film tube according to claim 13, characterized in that the excess pressure of the supporting air in the film tube (10) amounts to 0.1 to 10 mbar in the range of the air section (9).

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